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OUR FORESTS: A WASTED INHERITANCE

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IF there is any one duty which more than another we owe it to our children and our children's children to perform at once it is to save the forests of this country, for they constitute the most important element in the conservation of the natural resources of the country."*

From the dim past, when our ancestors were tree-dwellers, to the present day, forests have been intimately related to the welfare of man. The homes in which we live, the furniture which they contain, the vehicles and ships in which we travel, are made in part from forest trees. From the forests are derived certain foods, as well as materials which enter into the manufacture of clothing. The papers, magazines and books that we read have, in many cases, been made from spruce or hemlock trees. From the forests is obtained much fuel, the material used in making cross-ties, telegraph and telephone poles, fence posts, mine-supports, boxes, barrels, farming tools and machinery, matches, spools, pencils, and countless other things in daily use. Forests are of inestimable value in regulating stream flow, thus conserving the water supply, and lessening the number and the destructiveness of floods. This has an application to irrigation, navigation, the development of power, the removal of soil, and loss of property and life. Trees add a charm to the home and the street; they beautify the landscape, and they weave their influence into the spiritual as well as the material life of man. Each summer thousands of persons seek the forests in search of recreation, health or pleasure.

There are thus many reasons why we should have a knowledge of the forests. We should know their distribution, and upon

*President Roosevelt, Message to Congress, December 8, 1908

what this depends. We should understand how to make them of most use in supplying materials for various purposes. We should learn how they serve to check the removal of soil from the slopes, and the destruction of life and property wrought by floods. The cause and prevention of forest fires, as well as the most effective methods of fighting them, should receive much attention, in order that our great annual loss from this cause may be steadily decreased. In addition we should carefully study the problem of extending the area of timber land by planting trees on denuded areas.

In the early periods of the history of this country our forests seemed inexhaustible. They were in fact an obstacle to its development. The pioneer was obliged to cut and burn the timber and grub out the stumps before he could cultivate his land and raise a crop. For a long time the forests of New England met all local demands and furnished much lumber for exportation. The marvelous development of our country, and the constant European demand, in time drew upon the white pine resources of the Lake Region. Later the yellow pine belt of the South was invaded, and to-day the forests of the Pacific Slope are being rapidly felled. We are now cutting annually three or four times as much timber as grows during the same period, and hence the outcome is perfectly evident. In addition the removal of our forests means a failing water supply, and fertile agricultural lands turned into desert wastes.

It is quite natural that the individual should wish to handle his property in such a way as to make for immediate gain. It is therefore a difficult matter to induce those who own forests to manage them in such a way as to make for the interest of future generations. Hence the necessity of placing forest areas under the control of the government. On March third, 1891, Congress authorized the President to " set apart and reserve, in any state or territory having public lands bearing forests, any part of the public lands wholly or in part covered with timber, or undergrowth, whether of commercial value or not, as public reservations. " In the same year President Harrison created the first—the Yellowstone National Forest. On February the twenty-second, 1897, President Cleveland set aside thirteen areas as National Forests—a most fitting celebration of a great day. There were in the United States on January first, 1909, one hundred

and eighty-two National Forests with a total area of about 168,000,000 acres.

Much of this area is not in reality timber land. There is much waste land, and there are small tracts of agricultural land. The farm lands are open to settlement in the ordinary way. The mineral lands may also be filed upon and developed. Such timber as is actually required by the home maker who settles on these lands is given him. It is also given to communities when required for public purposes. Others must purchase. Ten per cent. of the amount derived from the sale of the timber goes to the counties in the National Forests for the maintenance of schools and roads, provided that this amount shall in no case exceed forty per cent. of the total tax of such counties. Owners of stock are permitted to use the forests for grazing purposes, a low rental being charged for this privilege. Our forest policy as established by Act of June fourth, 1897, is as follows: "To improve and protect the forest within the reservation, or for the purpose of securing favorable conditions of water flow, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States; but it is not the purpose or the intent of these provisions, or of the act providing for such reservations, to authorize the inclusion therein of lands more valuable for the mineral wealth therein, or for agricultural purposes, than for forest purposes."

The construction of roads, trails, fire-breaks, telephone lines, bridges, cabins, barns; the planting of trees and the fighting of fire requires a force of hardy and well trained men. These men are selected from those who have passed a civil service examination. In 1908 our Forest Service constructed 3,400 miles of trails, 3,200 miles of telephone lines, 100 miles of wagon-road, 600 miles of fence, 40 miles of fire-line, 250 bridges, and 550 cabins and barns.

For the protection of our forests—equal in area to the New England States plus Wisconsin, Illinois, Indiana, and Ohio—there is a field force numbering about 1,500 men. When it is remembered that most of the country to be guarded and developed is mountainous, the effectiveness of this very small force becomes the more remarkable.

Through the prevention and the fighting of fires our Forest Service saves large sums annually. These fires are, in many cases, the result of carelessness on the part of hunters, campers

and others. In the summer of 1902 fires raging in Washington and Oregon for nine days destroyed timber valued at $12,000,000. It is not simply the mature timber that is lost in such cases, but the young growth and the underbrush as well. Owing to the extension of trails, fire-breaks and telephone lines, as well as to increased care on the part of the public, fires do much less damage now than formerly.

The amount of money which our government appropriates for the great work of forestry is trifling when compared to what other progressive nations spend. In 1907 it amounted to but $1,400,000, a trifle less than one cent per acre. France spends $.95 per acre, Switzerland $1.32 and Germany from $1.25 to $3.58. If we spent as much per acre as does Switzerland, our annual appropriation would exceed $200,000,000. In spite of the small amount expended upon our forests, they are now self supporting, that is, they pay a very small actual profit. This amounted in 1907 to nearly one mill per acre.

Reforestation is chiefly a matter of benefit to future generations. Irving said, " He who plants an oak looks forward to future ages and plants for posterity. Nothing can be less selfish than this." The same may be said of the planting of trees upon our mountain slopes. The trees are raised from seed at nurseries in the forest, and are transplanted by the rangers. About 700,000 were set out during 1908. In humid regions the sowing of seeds in the forest has produced satisfactory results.

There are but two civilized nations that do not practice forestry —China and Turkey. European countries are far ahead of us, for with them forestry is well established, and its value fully recognized. A century and a half ago Germany began to feel the effects of a timber shortage, and to realize the loss to agriculture from the removal of the forests. This led to the development of a forest service which has been so scientifically handled that in 1904 the net returns from the forests of Prussia were $2.50 per acre, while the output of timber is steadily increasing. In the Black Forest the income from the trees is more than sufficient for the maintenance of the splendid system of roads of which that region may well be proud.

The removal of forests from the slopes of the Alps, the Cevennes and the Pyrenees caused the loss of soil and serious floods in France. As a result 800,000 acres of agricultural land were

ruined, and many people reduced to poverty. In 1860 the state took up the question of forest protection and reforestation in earnest. Already the results are remarkable. Floods have been prevented in more than 150 torrents, and checked in more than 650 others. In Gascony the destruction of vineyards by sand dunes has been checked by the planting of trees. In the section known as the "Landes" 200,000 acres have been saved from the sands, and are now covered with forests valued at $100,000,000. In speaking of this great work Consul D. I. Murphy says: "Prior to 1803, the 2,500,000 acres comprised in the Department of the Landes were little more than shifting sand dunes and disease breeding marshes. This section is now one of the richest, most productive, and healthful in France. This marvelous change has been brought about by the intelligent cultivation of pine forests. Immense forests now cover the country, and sand dunes and marshes have long since disappeared, and the wood, charcoal, turpentine, rosin, and kindred industries have brought wonderful prosperity to the entire department, which was formerly the most barren and miasmatic in France. The climate is now mild and balmy, the great change being wrought by the forests. The thin layer of clay beneath the sandy surface, formerly impervious to water, has been so pierced by the roots of the pine that there is now thorough drainage to the spongy earth below."*

The beautiful Swiss Alps, if stripped of their forests, would overwhelm the valleys with flood and rock-waste, and the streams, no longer having a steady flow, could not be depended upon for the development of electric energy, so important to Switzerland because of her lack of coal.

Realizing the importance of her forests, Switzerland, as already indicated, spends large sums upon them, and receives a net profit varying from $3.00 to $12.00 per acre annually. The law requires that logged areas must be replanted within three years from the time of cutting.

The portion of Austria lying along the Adriatic, and known as the "Karst," furnished Venice with timber for centuries. The removal of the forests reduced this region to an almost worthless condition. Since 1865 400,000 acres in this district have

*Consular Reports, March, 1908.

been planted to trees, and eventually the whole area may be reclaimed.

Russia, although still having vast forests, began the work of forestry long ago. The liberation of the serfs in 1861 temporarily checked the proper handling of the forests. The government now owns 65 per cent. of the forest area. Forests which prevent the migration of sands, regulate stream flow, or hinder avalanches are classed as "Protection Forests" and may not be cleared. In order to encourage tree planting on private holdings the government distributes seedlings free of cost. The net income from the government forests averages about three and one-fifth cents per acre. In Finland the cutting of trees that measure less than ten inches in diameter at a height of twenty-five feet from the ground is prohibited, and not more than twelve acres can be cut without preparing for a new growth.

Italy and Spain have suffered severely as a result of the destruction of their forests. Streams which were formerly permanent are now dry during the summer months. In 1907 a flood near the city of Bologna did damage to the extent of $1,000,000. No nation has sustained a greater loss as a result of deforestation than has China. Northern China has practically no timber left. Slowly the hills and mountains have been robbed of their natural covering, and the streams have completed the devastation by sweeping away the soil. Great acres which formerly supported a large population are now dreary wastes practically uninhabited.

United States Consul, Ernest L. Harris, of Smyrna, Turkey, says of the results of deforestation in that land: "The disappearance of the forests in this country, especially in the Villyat of Smyrna, has been marked by greater degrees of heat and cold. The date palm has practically become extinct in these parts. In the winter and spring there are usually floods, which are destructive to life, property and crops. In the summer there is not sufficient moisture in the soil of many districts for the reason that the rain passes away at once down woodless ravines, without being absorbed by the ground. As a result large tracts have become sterile. Creeks and brooks which formerly retained considerable water, even in the heat of summer, are now completely dried up a few weeks after the spring rains."*

*Consular Reports, May, 1908, page 182.

Forestry is a subject in which our own and every enlightened nation is to-day deeply interested. It is one of the most vital questions now before the people of the United States. The conservation of our forest resource, and the reforesting of denuded areas, is a matter which concerns the welfare of every resident of our land. The waste of national wealth means loss to every man, woman and child, just as truly as the loss of the possessions of a family means suffering to every member of that family.

In three hundred years we have brought an inheritance which seemed practically inexhaustible, to the point where poverty faces us. There are men now living who have seen valuable timber burned in order to clear the ground. They have seen the best of walnut and maple used for fuel, and yet, according to our highest authority, Gifford Pinchot, our supply will, at the present rate of consumption, last but twenty years.

In wasting our forests we have suffered great loss in other ways. The streams, unrestrained because of the removal of the forest cover, have swept vast quantities of fertile soil from the land, thus lessening productivity. This is painfully apparent in many districts in the South. This soil, after clogging rivers and harbors to the detriment of navigation, is dredged out at great cost. Floods have increased, and annually cause great damage in city as well as country. The water-table has been lowered, thus adding to the cost of raising the water to the surface. Water powers are threatened, and this is striking at one of our greatest resources.

If we would profit by the experiences of China, India, Turkey, Greece, Italy, Spain and France, our Forest Service must receive abundant support, and individuals must coöperate by exercising the greatest care to prevent forest destruction by fire and other unnecessary means. Only by prompt, vigorous and intelligent action shall we be able to transfer even a small part of our vast inheritance to those who are to come after us, and who must suffer great loss if we are unfaithful to our trust.

MAP DRAWING IN THE SCHOOLS*

By Douglas Wilson Johnson

Harvard University

AS a part of the course in geographical instruction some work in map drawing is introduced by many of our schools. The object of this work is not so much to give pupils training in the art of drawing, as it is to give them a certain familiarity with the outlines and positions of the more important land masses of the globe. Certainly the object is a worthy one, for a knowledge of the outlines and relative positions of the continents is of incalculable service to anyone who reads and thinks.

Recent years have witnessed a wonderful improvement in many phases of geographical teaching, particularly in the more advanced departments of our science. Attention has been directed principally to physical and commercial geography, and the places they should occupy in geographical instruction, rather than to problems in elementary geography. It seems possible, therefore, that there may yet be room for improvement in so simple a subject as the drawing of maps. If improvement is possible here, the task of securing it is worthy of our serious attention; for the benefits of improvement will be reaped not only by those who later enter higher schools, but also by the far larger group who early leave the school-room to test more quickly the practical value of the instruction they have received.

That map drawing in the grades does not now accomplish all that we may reasonably hope for it, is a conviction which grows upon the man or woman who gives the subject any study. Each investigator may, indeed, have different ideas as to just what map drawing should accomplish for the student; but surely the standard of accomplishment is not a high one which is satisfied by the present results. Let us consider for a moment the good to be secured by instruction in map drawing, and endeavor to set for ourselves a standard, reasonably ambitious, yet not beyond attainment. Then we will be in a position to test the results at

*Address before the Connecticut State Teachers Association, New Haven and Hartford, October 22, 1909. Reprinted, with certain illustrations omitted, from the Popular Educator, January and February, 1910.

present secured by map drawing in the schools, and thus to learn whether they measure up to our standard. If they do not, it will be pertinent to inquire why not, and to suggest possible improvements.

First, what good may be secured from instruction in map drawing? We have an abundance of cheap maps better than those the students will draw; but we are all convinced that the mind of a student does not apprehend details of outline, general form or relative position so readily from a printed map as from the experience of making a map of his own. Map drawing fixes the attention upon features and relations which might otherwise pass unnoticed. But having directed the attention of the student to these points, shall we pass at once to something else? Judging from the work as now conducted in the schools the answer to this question is "No; it is worth while to have the student draw all or parts of the same thing several times, to fix important points in his mind." It is generally admitted that a fairly good mental picture of the outlines of continents, countries, important islands, etc., is an asset worth possessing, and that map drawing helps the student to acquire this asset. The "atlas habit" is a good habit, and we delight to observe it in the student who studies the pages to find geographical details with which few care to burden the memory. But how poor geographically is the mental equipment of the mature student who must turn to an atlas to find out whether or not South America lies directly south of North America; or what is the general shape of his own continent. The "memory-map habit," as well as the atlas habit, is a valuable asset; and one which is essential to the intelligent appreciation of much which a man sees and hears at times when an atlas is not conveniently available.

Indeed, it would be difficult to overestimate the value of a correct mental picture of the broader features of the earth. Such a mental picture is of value not alone in the study of geography in its various phases, but in the study of many other subjects, such as history, economics, and government; and in the daily reading of newspapers and magazines, and the daily conversations of intelligent people concerning current events. If this memory map is to serve its possessor properly, it is not sufficient that the outlines of the land masses be memorized correctly; the positions of the land masses must also be fixed in mind. A discussion of

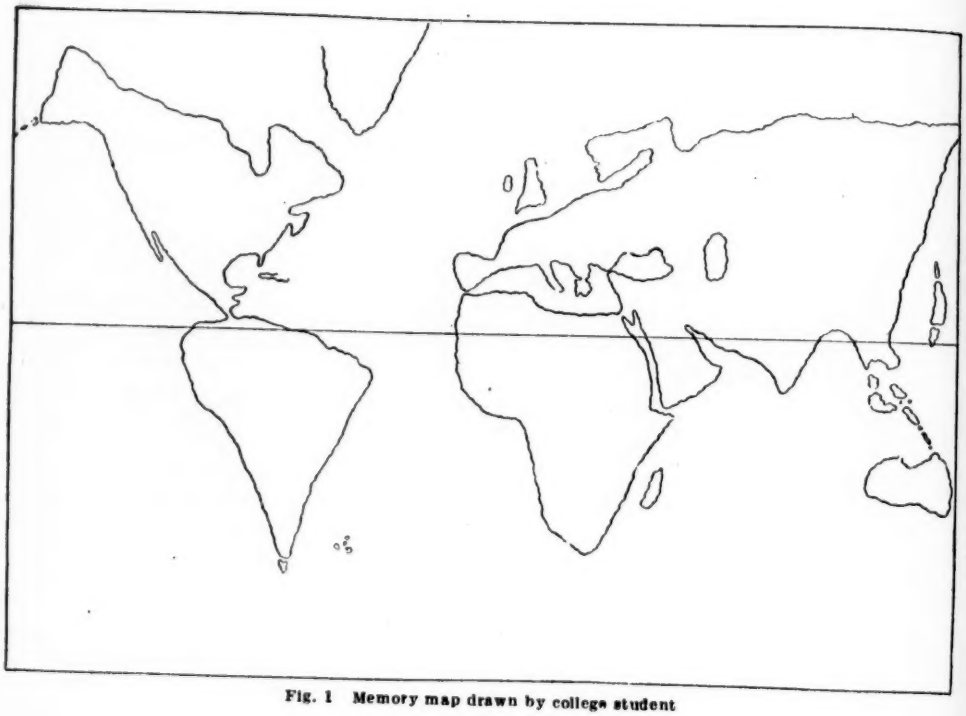

Fig. 1 Memory map drawn by college student

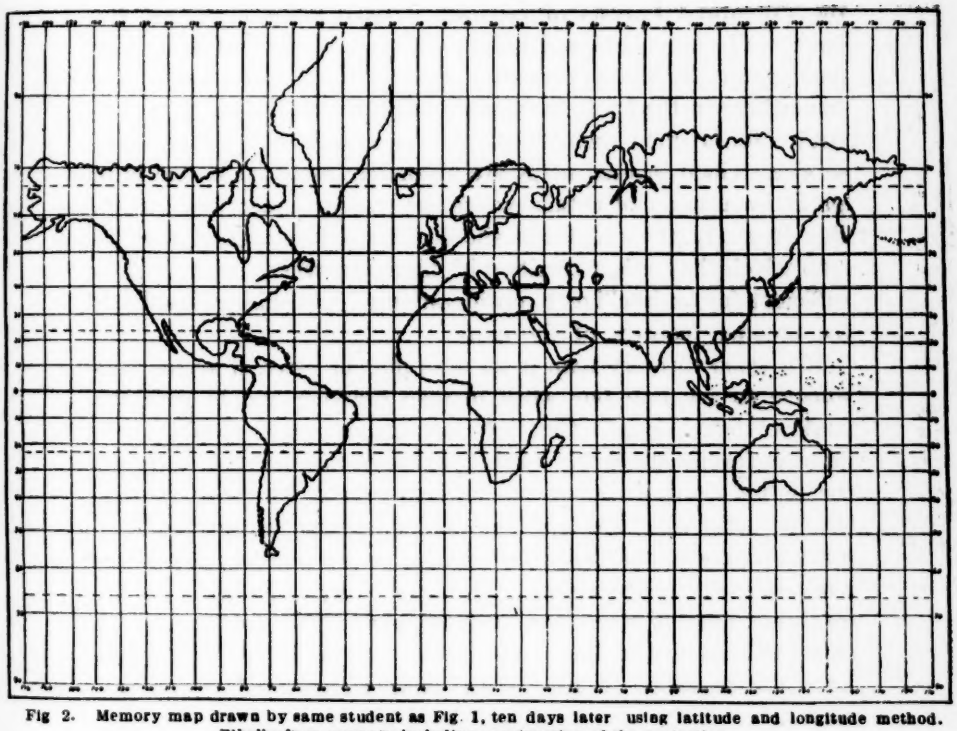

Fig 2. Memory map drawn by same student as Fig. 1, ten days later using latitude and longitude method. Wholly from memory including construction of the projection.

the cotton producing areas of the world loses much of its significance for the man or woman whose mental world map has Egypt located under the Equator, the plateau of the India Peninsula south of the Equator, and the southeastern United States under the Tropic of Cancer. If you wish an example of the mental confusion which arises from a bad memory map, ask a person whose mental picture of Africa has the Equator crossing the Sahara Desert (there are multitudes of such persons), to locate the Equatorial Forests of Africa. Printed maps in books, and large wall maps displayed before classes are of great service in making an effective presentation of many subjects. But a map somewhere in the book, or sometimes on the wall, is a poor substitute for a good memory map always and instantly at one's service. Good printed maps are absolutely essential if one is to profit by a study of details which he can not carry in mind. But the study of these details should be based on a good memory map which the student carries with him everywhere, and which is sufficient for an intelligent consideration of any subject involving the broader features of the earth.

If a good memory map is so desirable an asset, it seems reasonable to ask that our work in map drawing should give the student such a map. Certainly we are not over ambitious in desiring for our students a mental picture of the earth which shows the outlines and positions of the larger land masses with reasonable accuracy. That such an ambition may be fully realized for most students I firmly believe. The basis of this belief is more fully set forth below. For the present, at least, let us set up this standard for the map drawing work; that it shall give the student the ability to draw from memory, maps in which the outlines and positions of the larger land masses are reasonably correct.

Do present results measure up to this standard? I fear they do not. I have endeavored to test the matter in a variety of ways, and so far as my experience goes the average boy or girl, and I may add, the average man or woman, carries in the mind a very vague and distorted picture of the continents. My attention was first directed to this subject in connection with a course on Economic Geography in Harvard University, at the beginning of which I endeavored to ascertain what mental pictures of the continents college students had at their service. Allowing plenty of

time for the task, I asked each student to draw the best map of the world which he could construct from memory. (See Figs. 1 and 2). The results were appalling. Men who had followed with interest the events of the Russo-Japanese War, drew the entire coast of Asia without the pretense of a peninsula or a gulf, and placed Japan under the Equator. Nor was this a particularly bad year for memory maps. I have since tried the experiment repeatedly, and always with most discouraging results. This year, in a class of forty men, seventy per cent. of the class placed the Equator in northern Africa, or entirely north of that continent in the Mediterranean Sea. Seventy-five per cent. thought South America should be centered directly south of North America. Fifty per cent. extended the peninsula of India south of the Equator, a few making that peninsula about the size of Africa and extending it about as far south as the southern point of that continent. In one-fifth of the maps the Equator does not touch the continent of South America. In one-half of the maps Africa extends as far south as South America; or a good deal farther south. So much for some of the common errors of position. As for the outlines, it would be difficult to set forth clearly the kinds or degrees of errors made. Many of the representations of the continents show not the slightest resemblance to their prototypes. Fully fifty per cent. of the maps of Asia would be utterly unrecognizable without labels printed on them, unless associated with the rest of the drawings. In many cases the drawings of Africa and South America could exchange places without marring the value of the map. Such is the mental background upon which college students arrange geographical items encountered in their daily reading and in many of their studies.

It may be argued that the test was applied too long a time after the students had practiced map drawing to be of any significance. I can not accept this argument as valid, for in my opinion map drawing properly taught will make it impossible for a student to relapse into such a condition of map ignorance as is evidenced by the results of my experiments. This is a matter to which we will recur later. Let us consider for a moment the work of grade pupils in the schools. Last winter I had an opportunity to supervise some work in map drawing by fifth, sixth, and seventh grade pupils. These pupils had previously been doing more or less map drawing, and some of them were required by the teacher to draw

from memory maps of certain continents, with the greatest possible speed—minute maps, as they were called. The principal criticism merited by the minute maps was that they were based on poor mental pictures; for the pupils could not draw good maps of the same continents when given ample time. The results of our numerous experiments, carried on through the winter, furnished convincing proof that in the three grades mentioned the map work could be improved in a truly remarkable degree with the aid of improved methods.

It has been claimed that frequent use of maps will of itself give the user a good mental picture of the continents, and that no special practice in drawing maps is needed by such a person. It occurred to me that if this claim be true, teachers of geography should be especially well equipped with memory maps of the continents. Accordingly I asked a class of more than a hundred geography teachers to draw from memory the best maps of the world which they were capable of producing. A few gave up entirely after several attempts, saying that they had not the slightest idea of shape or relative position when deprived of the aid of printed maps. Others persevered, and committed the same kinds of errors of which the college students were guilty. In answer to the question "Do you not teach your pupils to draw maps?" several teachers replied, "Oh, yes, I make the children draw maps, but I never try it myself." A few weeks later these same teachers demonstrated their ability to draw excellent maps from memory after having given a little systematic study to that branch of their work.

There is no need of further argument in support of the conclusion that the exercises in map drawing now performed in the schools, whether many or few in number, generally fail to give results up to the standard which we established in the first part of this discussion. Any one who makes a careful study of the results of this work must be convinced that for some reason, or reasons, school pupils and college students, school teachers and people in general, have a very vague and unsatisfactory mental picture of even the largest features of the earth. Let us next consider the reasons for this state of affairs.

(To be Concluded.)

REPORT OF COMMITTEE ON GEOGRAPHY FOR SECONDARY SCHOOLS*

By Richard Elwood Dodge, Chairman

SINCE your committee was organized in the early spring the subject of High School Geography, which was discussed at our Round Table a year ago, has been actively considered in many parts of the country and the general suggestions of the syllabus presented at the Round Table have been supported widely. Several articles have been printed advocating some increase in the emphasis given to human geography and the Committee of the National Educational Association, through the Chairman, Professor J. F. Chamberlain, has made a long and full report. This report was published in full in the JOURNAL OF GEOGRAPHY in September and in *School Science and Mathematics* for November.

At the recent meeting of the Central Association of Science and Mathematics Teachers, the two sessions of the Earth Science Section were devoted to the topic under consideration and at the close of the session the following resolution was adopted:

"Resolved, that the Earth Science Section of the Central Association of Science and Mathematics Teachers express its sympathetic attitude toward the proposed course of study for geography for secondary schools to the effect that the present course be modified so as to include a large amount of human geography; that the final goal should be regional geography in some form; that this regional geography should be based on a thorough study of the elements of physical geography and should include the most important principles and details of industrial and commercial geography."

A study of the actual conditions in certain parts of the country shows that work of this type is now being given in several of the larger normal and secondary schools and that the demand for the form of work prevalent during the last few years has greatly decreased, especially where the newer work has been introduced in other schools in the same locality. In one city, laboratories

*Presented at the 1909 Meeting of Association of American Geographers. Report accepted and committee continued with privilege of adding to its membership.

for physical geography with an equipment valued at over three thousand dollars are practically without pupils and in the City of Cleveland an enrollment in physical geography of 525 pupils in 1900 has been reduced to one of 292 pupils in 1909.

Opinions from widely scattered regions show the necessity of an evolution but not a revolution in our secondary school geography. Your committee is a unit in its conviction that the present "disciplinary" quality of the work must be maintained and that the satisfactory results from rational laboratory work must in no way be lessened in any change in emphasis given to different phases of the subject. Several members of the committee fear that the possibility of a greater emphasis of human geography is a distant one because of the probable lack of trained teachers. On the other hand it should be noted that work of the kind necessary for future high school teachers is now being given in many of the normal schools which, outside of the east, frequently prepare pupils for secondary as well as elementary work, and that the leading universities are now giving regional as well as physical geography courses to large and constantly increasing classes. The teachers prepared for the new work are greater in number than were the prepared teachers for the new type of physical geography fifteen years ago. To-day not one-half, perhaps not one-fourth, of the teachers now conducting classes in physical geography have had any special training and their preparation for one type of work is as good as that for any other. They are victims of textbooks and courses of study.

Your committee is also a unit in believing that physical geography should not be displaced but modified and that an understanding of the essentials of physical geography is necessary as a preparation for any regional study whether that study be a general study of typical areas and "responses" or whether it be a study of selected regions from a causal standpoint—that is, after the order of treatment followed by the better teachers in the upper grades of the elementary school, but much more deeply and scientifically.

Your committee further hopes that it may be possible in the near future to have a second year of geography work following a course in humanized physical geography—which second year should be acceptable for college entrance at the same time that

it is of practical, immediate value to the pupils in their school work and as a preparation for after school life, which will come to most pupils not later than the end of the second year in the high school. This hope is, however, an ideal which may be long deferred. The demand of the hour is for the best course in geography—not necessarily physical geography—for pupils in the first or second year in the high school.

It is a practical problem we must meet and your committee therefore recommends that we suggest a course of study that shall outline the essentials in physical geography and be followed by a course in either:

a. Commercial or industrial geography, or
b. Regional geography of the United States and Western Europe, or
c. A study of selected physical regions of the world, with an emphasis of the life relations.

Your committee recommends that the course to follow the preliminary course in physical geography be the regional study of the United States and Western Europe, culminating in the commercial status of these regions in the world's history. The treatment of these regions should be by physical and climatic divisions, a form of treatment which is well outlined in the chapters devoted to the British Isles in Herbertson's Senior Geography.

Although your committee believes such a course to be the most practical and valuable, it does not feel that its recommendations in this regard should be so definite as to preclude human geography of the other types listed above for those schools or teachers who are prepared to do the other kinds better and more advantageously. Our recommendation is that this work should be based on the elements of physical geography and that the principles of physical geography should be constantly applied in the interpretation and study of the selected regions or phases of human geography.

To summarize: The problem before us is, given one year of time available for geography in the first or second year of the high school, (1) what is the best content of such a course from the standpoint of present and future needs of pupils; (2) how large a part of this time should be physical geography; (3)

what is the point of view from which the essentials should be selected and what is the object for which these essentials are to be taught.

The following outline of work all over the country is not planned especially for the glaciated section or for the section of residual soils, and certain topics of themselves important in certain localities are not included in regions where they are not locally important, or in other sections will be introduced at the time of studying the region where found in the course of the work on the regional geography of the United States. For instance, glaciation and volcanoes, lake plains, lava plains and similar topics are not presented as a part of this course planned for all localities.

The following outline of physical geography is therefore offered as a point of departure in attacking the later problem of the geographic work as a whole that should be included in all high schools, not to occupy more than two-thirds and preferably one-half of the year:

The Earth as a Whole.
- The relations in space of the earth, moon and sun. Full moon, new moon.
- Shape and size.
  - Proofs. Significance in human occupations and daily life.
  - Inclination of axis.
- Earth Motions.
  - Rotation.
    - Proof, rate, significance.
  - Revolution.
    - Variation of seasons and significance in agriculture. Variation in length of day and night.
    - Mathematical zones. Pole, Equator, Tropics and Circles.
  - Latitude and Longitude.
    - Meaning. Origin of terms.
    - How secured. Meaning, use.
    - Time. Standard Time. International Date Line.
    - Maps and their use. Scale and projection.

The Atmosphere.
- Elements of weather and climate.

The Atmosphere—*Continued.*

Heat Belts and their meaning. Distribution of great nations in reference to Heat Belts.

Pressure.

How measured. Seasonal and annual conditions.

Winds—Great wind systems and the relations of continents thereto.

Humidity. Relative humidity; causes for variation; significance of humidity.

Rainfall.

Relations to winds and larger surface features. Causes of rain; distribution of rainy and dry regions; relation to occupations and industries.

Storms—especially temperate latitude cyclones.

Types of weather conditions from weather maps. Relation of weather to industries, transportations, etc.

Climate of World.

Broader climatic areas and their principal subdivisions into East Coastal, West Coastal and Interior Regions.

Distribution of principal countries according to climate.

Summer and winter climate in United States.

Climate of the growing season and importance.

The Lands.

The land as home of man. Relation of man to land, water and air.

Simple study of processes producing changes on surface of land and the surface features locally to be seen which are a result of these processes. Especial emphasis of work of running water, standing water, ice and atmosphere. Youth, middle age and old age.

The larger land forms.

Plains. Character of plains; significance of plains historically.

Alluvial plains. Character, distribution and importance. Life features associated therewith.

Coastal plains. Character, distribution and importance. Life features associated therewith.

Interior plains. Character, distribution and importance. Life features associated therewith.

The Atmosphere—*Continued.*

The Lands.

Regions of low relief.

Note: Defer lake, lava, glacial and other plains until in the regional study they will naturally be included.

Plateaus.

Character, elevation, results of dissection.

Occupations and life conditions on plateaus.

Broken plateaus.

Plateau countries.

Mountains.

Essentials of a mountain. Ranges, systems, peaks, passes.

Mountain building and earthquakes.

Surface features and life relations of folded, block and massive mountains.

Relation of mountains to climate and rivers. Mountain regions over the world.

Note: Broken plateaus and block mountains may well be deferred until they occur in the later descriptive work.

Soils.

Importance of soils.

Character and origin of local soils.

Fertile and infertile soils as related to crops and distribution of population.

Great groups of soils and their distribution.

Relation of soils to climate and water supply.

Water supply.

Ground water, evaporation and rainfall.

Importance of ground water. Seasonal variation in water table.

Relation of ground water to man, animals and plants.

Artesian water and irrigation briefly noted in areas where not to be seen locally.

Importance of Valleys.

Valleys as routes of travel and centers of occupation.

Strategic points in river valleys.

Mouth.

The Atmosphere—*Continued.*

The Lands.

Strategic Points in river valleys.

Head of tide, of navigation.

Falls, head of lake, foot of lake.

Junction of tributaries.

Water gaps.

Bluffs.

Carries.

Head of delta.

Mouth of principal distributary.

The Ocean.

The extent of the ocean. Ocean Basins and continents.

Ocean as a highway and source of food supply; its effect on climate. Man's concentration near the ocean.

Fog areas, ice floes, fishing banks, cable paths.

Shorelines.

Regular and irregular. Larger problem of origin.

Drowning. Relation to harbors and shipping.

Delta shorelines.

Waves and tides as related to accessibility of harbors.

Tidal occurrence, interval, relation to sun and moon. Cause omitted.

Currents.

General direction as related to winds.

Special currents.

Monsoon currents in India.

Relation to distribution of temperature.

Great ocean routes as related to winds, currents and continents.

Distribution of plants as related to climate and surface.

Larger world divisions.

Special features in United States, as evergreen forests, mixed forests, grazing and dairy areas, mixed farming, cotton, corn, winter wheat, spring wheat areas, etc.

RECENT PUBLICATIONS.

HANDBOOK OF ALASKA. By A. W. Greely; pp. xiv+280. New York, Charles Scribner's Sons, 1909.

An interesting, authoritative and well illustrated volume of reference on Alaska. Its twenty-seven chapters deal with all phases of Alaskan geography. The best all-round account of Alaska available.

GEOGRAPHICAL ESSAYS. By William Morris Davis, and Edited by D. W. Johnson; pp. vi+777. Boston, Ginn & Company, 1909.

A reprint of twenty-seven essays published at different times by Professor Davis, whose masterly work in educational and physiographic geography for many years makes commendation of this volume unnecessary. Twelve essays deal with educational themes, all of which are a necessary source of reference for all workers in the field.

A valuable volume in that it makes readily available many early papers not hitherto easily secured, and presents in united form a large part of the history of the development of geography in the last two decades.

AN OUTLINE STUDY IN GEOGRAPHY. By Maud E. Kingsley; pp. 37. Boston, The Palmer Company, 1909.

A suggestive little volume for teachers in elementary schools. Neither a course of study nor a review manual, but a little of both that calls for map work and thinking.

THE TEACHING OF GEOGRAPHY. By Lionel W. Lyde; pp. 119. London, Blackie & Son, 1909.

A series of suggestive lectures by an experienced and most expert teacher of youth, dealing with problems in elementary school geography as pertinent to British ideals. A book that should be known in this country especially by teachers of geography in normal schools.

TRAITE DE GEOGRAPHIE PHYSIQUE. By E. de Martonne; pp. 910. Paris, Armand Colin, 1909.

A splendid volume on physical and bio-geography. Copiously illustrated and provided with very valuable map references to illustrative detailed maps of the several countries. A necessary volume for reference.

NOTE

TRANSPORTATION FACILITIES OF MANCHURIA.—Undoubtedly the most interesting feature of Manchurian commerce is the great cart traffic of the interior. In South China the population is so dense and the villages so numerous that produce is transported almost entirely by coolie labor, and roads so-called are mere foot-paths. But the agricultural products of Manchuria,—the coal, the package freight,—all find their way to market on a two-wheeled Manchurian cart, heavy and cumbersome, drawn by four to eight mules and ponies. The average load of one of these carts is about 1600 pounds, or 800 board feet of lumber.

In the winter time long trains of these carts, carrying tobacco, wheat, hemp, and other products, travel anywhere from 50 to 400 miles to market and present a most picturesque appearance. The mule teams are guided without rein or bit, the carter shouting his commands and enforcing obedience with a long leash attached to the end of a bamboo pole. Often in his manoeuvering and whipping he cracks his whip about the head of a mule or pony and snaps out an eye, and hardly a mule team can be seen that has a full set of eyes. A train of these carts will average about thirty miles' travel a day, and when night settles down a scramble begins to find accommodations in the wayside inns that line the highways. Soon the mules are unhitched and feeding in the open yard, while the carters warm themselves over the bricks of the Chinese kangs, drinking samshu (native wine) and recounting the experiences of the day. By eight o'clock everybody is asleep and snoring loudly, and then at 5 A. M., in the frost and chill of the morning, the carters arise to squabble with the innkeeper and to hitch up for the day's travel. By 6 A. M. the last cart, with its swinging lantern, has left the inn to renew its long, weary journey marketward.

If you chance to be an observer of commerce you wonder how these carts can travel such tremendous distances with loads of such little value, and you show by statistics that it is uneconomic and that often the cost of transportation is greater than the value of the load; but nevertheless the carts continue their creaking trips and compete for long distances with the Russian and Japanese railways. These people and their methods, however, are not

to be measured with figures as are those of Western people. The country farmer consumes a large part of his crop and exchanges only a small part for cash. His time is worth nothing, and as for depreciation and all that sort of thing,—he knows little and cares less. And so it is that the carts carry their loads from the tobacco fields of Kirin to Mukden and Newchwang in the South, 350 miles away, and wheat comes into the mills from a distance of 200 miles.

Again, if perhaps you have watched the wagons of the American grain grower going to market with from fifty to seventy-five bushels of wheat drawn by two horses, you wonder at this crude two-wheeled cart of the Manchurian countryman that tips over on the slightest provocation and cuts such deep ruts in the roads. But your wonder ceases when you have seen the typical Manchurian road, and you see that a modern farm wagon with its four wheels would be useless here. Roads in Manchuria are not surveyed, nor legally controlled. Like Topsy, "they just grew," and they grow always from bad to worse, with nobody to arrest the movement. In time they become canals and rivers in the rainy season, and farmers unlucky enough to own land adjoining a road build up dikes to keep out the water that gathers. At times traffic is absolutely stalled and business stops even in the cities, because nobody can get anywhere. When the roads become impassable in the country the carters leave the regular road and ruthlessly drive across anybody's land that is high and dry. Sometimes this deviation from the troubles of travel fails because the land owner and his boys come forth with mattock and spade and dig a trench behind a dike along their land and the carter is forced to stay by the main road until he can find an opening on a less diplomatic farmer's land. And so the roads come to wind in and out in the most unreasonable manner, fording streams until a wallow is formed and then deviating to a new ford with a consequent diversion from the shortest route.

—From *American Review of Reviews*, December, 1909.